Do Bilinguals Earn More in Texas?

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Introduction

Curious about the effects of knowing a second language on income, I used data from the *2017 American Community Survey* to analyze the economic advantages associated with bilingualism for adults 18-64 in Texas who reported an income and positive weeks worked in the year prior to the survey. *Bilingualism* is defined as speaking a language at home other than or in addition to English.

Method

Multiple Linear Regression:

$$\hat{Y}i = B_0 + B_1SCHL_i + B_2AGEP_i + B_3Bilinguals_i + B_4MAR_i + B_5Female_i + B_6Black_i + B_7WKW_i$$

Data

Data taken from the 2017 American Community Survey for 122,844 individuals after restricting for individuals who reported an income and positive weeks worked. The expected effect for each variable is indicated in parentheses.

Dependent Variable: Income (PINCP)

Independent Variables:

- Education Attained (SCHL) reported as years in school completed. (+)
- Age (AGEP) in years. (+)
- Bilinguals: a dichotomous variable equal to 1 if self-reported as bilingual, zero otherwise. (+)
- Married (MAR): a dichotomous variable equal to 1 if currently married, zero otherwise. (+)
- Female: a dichotomous variable equal to 1 if female, zero otherwise. (-)
- Black: a dichotomous variable equal to 1 if self-reported as Black or African-American, zero otherwise. (-)
- Weeks Worked (WKW): Number of weeks worked during the past 12 months. Numbers assigned were a mean of the range provided for each designated number in the PUMS data dictionary. These numbers were: 51, 48.5, 43.5, 33, 20, and 7. (+)

Descriptive Statistics

	PINCP	*AGEP*	*Bilinguals*	*MAR*	*SCHL*	*Female*	*Black*	*WKW*
Mean	53922.75	40.84	0.20	0.56	18.24	0.47	0.10	45.91
Minimum	-5600	18	0	0	1	0	0	7
Median	36000	41	0	1	19	0	0	51
Maximum	1015000	64	1	1	24	1	1	51
Standard Deviation	68132.29	13.04	0.40	0.50	3.68	0.50	0.29	11.83
Range	1020600	46	1	1	23	1	1	44

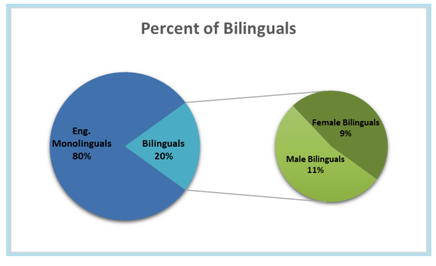
Only 20.08% of the individuals self-reported as bilinguals. The mean number of years in school is 18.24 meaning that the average individual had one year of college or less, but the range shows great variation in education.

Also, 56.39% of the individuals reported they were married, 46.74% of the individuals were women, and 9.52% were black. This shows a skew of the data sample in favor of male, non-black, and married individuals.

Characteristic	Bilingual	English Monolingual
Sample Size	24671	98173
Average Income	48,071.27	55,393.23
Average Age	38	41
Race/Ethnicity in %		
Black	3	11
Non-Black	97	89
Total	100	100
Average Experience	17.02	20.24
Average Experience Squared	460.66	593.8
Average Years of Education	18.3	18.2
Educational Attainment in %		
Less than H.S.	11	11
H.S. Grad/GED	25	23
Some college/Associates	32	32
College Graduate	19	23
Masters or Professional Degree above a bachelors	12	33
Doctorate	2	1
Total	100	100

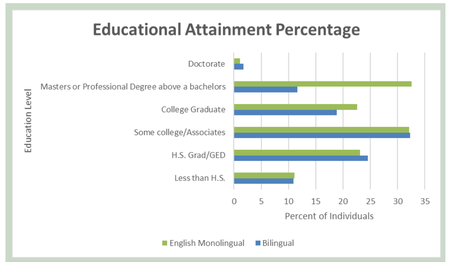
Created from data provided by the ACS
Notes: Results are for adults age 18-64 workers.

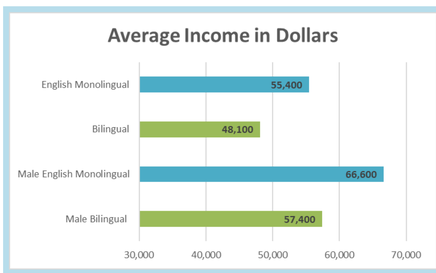
This table breaks down the differences in the independent variables between English monolinguals and bilinguals. They are expanded upon below.



Only 20% of the data self-reported as bilingual. Of those 20%, 9% were female and 11% were male.

Bilinguals tend to lie on either extreme of education level depending on the foreign language known. They report the highest percentage of individuals with doctorate degrees and the least with a bachelor's degree.





Bilinguals earned an average of $48,071, while English monolinguals earned 13% more, $55,393. That is, bilinguals earned only 87 cents/dollar earned by monolinguals. The 13% gap in income between those with and without knowledge of a foreign language may be in part to English monolinguals having a higher average age or additional years of experience.

Regression Results

I ran multiple regressions defining both income and experience differently in order to determine which model best represented the data. This model has an adjusted R^2 of 21.28% meaning that 21.28% of the variation in income could be explained by the independent variables as modeled.

Regression Statistics	
Multiple R	0.4614
R Square	0.2129
Adjusted R Square	0.2128
Standard Error	60448.4895
Observations	122844

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	1.21393E+14	1.73419E+13	4745.9702	0
Residual	122836	4.48845E+14	3654019880		
Total	122843	5.70238E+14			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-112863.4784	1169.8134	-96.4799	0	-115156.2930	-110570.6638
SCHL	5073.2195	47.2917	107.2751	0	4980.5286	5165.9104
AGEP	942.3817	14.2685	66.0464	0	914.4157	970.3477
Bilinguals	-5228.8683	435.0899	-12.0179	2.98714E-33	-6081.6372	-4376.0993
MAR	13615.7970	374.7256	36.3354	1.5225E-287	12881.3411	14350.2529
Female	-24244.5465	348.5711	-69.5541	0	-24927.7401	-23561.3530
Black	-11422.5282	595.6409	-19.1769	7.61237E-82	-12589.9743	-10255.0820
WKW	905.0225	14.9688	60.4605	0	875.6839	934.3611

Education attained (SCHL) demonstrates a positive effect on income and is statistically significant at the one percent level. In theory, the more knowledge an individual attains, the higher their cognitive ability and level of human capital.

Second, the variable for females is associated with a negative coefficient that is also statistically significant at the one percent level. Females earn a predicted $24,244.55 less than males, on average, holding all other independent variables constant. This is due in part to societal norms leading to women's "greater likelihood to reduce or leave paid work to care for children or adult family members and the combination of occupational segregation and lower median pay in occupations in which women make up a significant share of all workers employed" (United States Women's Bureau, 2017).

Third, a similar pattern is found for the variable for black as it is also associated with a negative effect on income and is statistically significant at the one percent level. Holding all other explanatory variables, blacks, on average, earn $11,422.53 less than non-blacks.

Consistent with existing academic research, being bilingual proves to be of no economic advantage in the workplace in Texas. This may be a result of actual need, how well-known a language is, or level of English proficiency. Although being bilingual proposes several advantages in terms of human capital, it does not appear to make a significant impact in the workplace.

Initially, I had expected to find that bilingualism was positively associated with income, associating its human capital value with an economic advantage. However, after reviewing the literature and working with the data presented, I can say that the relationship between bilingualism and income is complex and not so straightforward.

Bilingualism is associated with a negative coefficient reflecting that the data suggest bilinguals to experience a decrease of $5,228.87 in their income when compared to monolinguals, on average, holding all other explanatory variables constant. It is highly statistically significant at the one percent level. The data suggest that being bilingual is not beneficial in the workplace, "rather bilingual workers may be rewarded for the possession of unobservable human capital that correlates with, but is different from, the possession of bilingual skills" (Henley et al., 2005). All other variables held constant, individuals speaking a foreign language earn 13% less than English monolinguals. However, this statistic hides possible variation among different languages seeing that existing research notes that European language speakers do see an increased income (Saiz and Zoido, 2005). Lesser known languages tend to have a higher rate of return, as expected.

Conclusion

It is difficult to determine which specific factors contribute to variations in income seeing as the regression results report that given the explanatory variables, on average holding all other constant, only 21.28% of the variation in income could be explained by the model. Controlling for other explanatory variables demonstrates that bilinguals will, on average, earn $5,228.87 less than monolinguals. The impact of being bilingual does *not* result in a higher income in Texas, though it may vary depending on the language known in addition to English.